



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/713,572	11/12/2003	Kazuaki Sakurada	9319G-000593	8250

27572 7590 03/21/2007
HARNESS, DICKEY & PIERCE, P.L.C.
P.O. BOX 828
BLOOMFIELD HILLS, MI 48303

EXAMINER

TALBOT, BRIAN K

ART UNIT	PAPER NUMBER
----------	--------------

1762

SHORTENED STATUTORY PERIOD OF RESPONSE	MAIL DATE	DELIVERY MODE
3 MONTHS	03/21/2007	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

If NO period for reply is specified above, the maximum statutory period will apply and will expire 6 MONTHS from the mailing date of this communication.

Office Action Summary

Application No.

10/713,572

Applicant(s)

SAKURADA, KAZUAKI

Examiner

Brian K. Talbot

Art Unit

1762

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 March 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-12 is/are pending in the application.
- 4a) Of the above claim(s) 9-12 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-8 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date See Continuation Sheet.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: _____

Continuation of Attachment(s) 3). Information Disclosure Statement(s) (PTO/SB/08), Paper No(s)/Mail Date
:11/12/03;3/21/05;9/20/05;9/30/05;10/27/05;9/13/06.

Art Unit: 1762

1. Applicant's election with traverse of Group I, claims 1-8, in the reply filed on 3/5/07 is acknowledged. The traversal is on the ground(s) that claims are sufficiently related to one another and therefore no undue burden would be placed on the Office to examine them in a single application. This is not found persuasive because the issues that arise in prosecuting process and product claims are diverse and this would constitute a burden on the Office.

The requirement is still deemed proper and is therefore made FINAL.

2. Claims 1-12 remain in the application. Claims 1-8 remain active while claims 9-12 are directed toward a non-elected invention and should be canceled in response to this Office Action.

Specification

3. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.

Only method claims remain active in the application. No device or apparatus claims are active.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person

Art Unit: 1762

having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1,2 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 08-236,908 in combination with Speakman (6,503,831).

JP 08-236,908 teaches manufacturing of printed circuit boards with uniform thickness in which an insulating layer can be formed between fine pitch conductor patterns. The step of applying the insulating layer can be performed by electrostatic spraying and a contact hole can be formed thereafter by photolithography (abstract).

JP 08-236,908 fails to teach applying the conductor patterns and insulating layer by a droplet jetting method.

Speakman et al. (6,503,831) teaches forming microvias used in printed circuit applications where one requires interconnection between circuits that are laid one on top of the other making use of an interlayer dielectric isolation. Conventional holes are machined in the interlayer to provide access from the top layer circuit to the bottom layer circuit. Ink jet printing provides a means for achieving such microvias by printing discrete areas of material such as an interlayer dielectric on top of the metal contact leaving holes at strategic positions. A second printhead may then be employed to fill the printed holes with an appropriate material. A third head is used to form the top conductor layer (col. 33, lines 5-20). This technique of ink-jetting circuitry is advantageous as it eliminated the need for expensive via forming techniques such as photolithography and etching (col. 16, lines 60-65). The layers are dried and heating to form the patterns. UV radiation is utilized to cure the coated material or to be utilized for other treatments step including surface pre-treatment (col. 38, lines 44-64). A surface wetting layer can be

Art Unit: 1762

applied to the surface of a substrate to provide wetting and non-wetting areas for subsequent deposition (col. 33, lines 49-60). The conductive material includes particulates as well as colloids including metals such as gold, silver, etc. (col. 4, lines 50-60).

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified JP 08-236,908 multilayered printed circuit board process by forming the conductive and/or insulating layers by a ink-jetting process as evidenced by Speakman (6,503,831) with the advantages associated therewith, i.e. avoiding CMP to form a planar level as well as eliminating the need for via formation as detailed by Speakman (6,503,831) above.

With respect to claim 6 and the size of the droplets, it is the Examiner's position that this is a "result effective" variable which can be optimized by a practitioner in the art through routine experimentation and therefore does not render as a patentable difference absent a showing of criticality regarding the size of the droplets.

Claims 3-5,7 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over JP 08-236,908 in combination with Speakman (6,503,831) further in combination with JP 10-221,698 and JP 11-163,499.

JP 08-236,908 in combination with Speakman (6,503,831) fail to teach measuring and forming data on the circuitry to control the deposition of the insulating layer.

JP 10-221,698 teaches controlling paste quantities upon a substrate by utilizing a computer system to control the distance between the nozzle and the substrate (abstract).

JP 11-163,499 teaches controlling ink-jet deposition by connecting the ink jetting system to a computer and forming graphic information regarding the deposition of the conductive and insulative coating materials.

Therefore it would have been obvious for one skilled in the art at the time the invention was made to have modified JP 08-236,908 in combination with Speakman (6,503,831) multilayer printed circuit board process by utilizing a computer to measure and input data as evidenced by JP 10-221,698 and JP 11-163,499 because of the advantages associated with computer controlled system, i.e. increased precision/accuracy of deposition. Furthermore, it is well settled that it is not invention to broadly provide a mechanical or automatic means to replace a manual activity which has accomplished the same results. *In re Venner and Bowser* 120 USPQ192.

5. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Brian K. Talbot whose telephone number is (571) 272-1428. The examiner can normally be reached on Monday-Friday 8AM-4PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Timothy H. Meeks can be reached on (571) 272-1423. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1762

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

B K Talbot 3/16/07

Brian K Talbot
Primary Examiner
Art Unit 1762

BKT